

Amend abstract as follows or as indicated /

ABSTRACT

Modified proteins are disclosed that maintain enzymatic and insecticidal activity while displaying reduced or eliminated allergenicity. Epitopes which bind to anti-patatin antibodies were identified, and removed via site directed mutagenesis. Tyrosines were observed to generally contribute to the-allergenic properties of patatin proteins. Removal of glycosylation sites was observed to reduce or eliminate antibody binding.

Permuteins are also disclosed which have a rearranged amino acid sequence while retaining enzymatic activity.

Deallergenized proteins and permuteins can be used as insecticidal materials, as nutritional supplements, and as immunotherapeutic agents.